

IN THE CLAIMS:

1. (Original) An organic electroluminescent device having an anode (2), a cathode (3), and an intermediate element (7), which is set between the anode (2) and the cathode (3) and comprises at least one hole-transporting organic material, and at least one electron-transporting organic material; the electron-transporting organic material and the hole-transporting organic material being designed to form between them exciplexes or electropoles; the device (1) being characterized in that said intermediate element (7) comprises at least one luminophore material; the luminophore material being designed to emit electromagnetic radiation; the luminophore material being supplied, in use, for transfer of energy from said exciplexes or electropoles.

2. (Currently amended) The device of claim ~~according to Claim 1~~, wherein said intermediate element (7) essentially includes a first layer (4), which comprises the hole-transporting organic material and is set in contact with the anode (2), and a second layer (6), which comprises the electron-transporting organic material and is set in contact with said cathode (3) and said first layer (4).

3. (Currently amended) The device of claim ~~according to Claim 2~~, wherein said first layer (4) comprises the luminophore material.

4. (Currently amended) The device of claim 1 ~~according to any one of the preceding claims~~, wherein said anode (2) is substantially transparent.

5. (Currently amended) The device of claim 2 ~~according to any one of Claims 2 to 4~~, wherein said first layer (4) comprises polycarbonate (PC).

6. (Currently amended) The device of claim 1 ~~according to any one of Claims 2 to 5~~, wherein said electron-transporting organic material has a first ionization potential and said hole-

transporting organic material has a second ionization potential; the first ionization potential being higher by at least 0.7 eV than the second ionization potential.

7. (Currently amended) The device of claim 1 ~~according to any one of the preceding claims~~, wherein said electron-transporting organic material has a first electronic affinity and said hole-transporting organic material has a second electronic affinity; the first electronic affinity being higher by at least 0.4 eV than the second electronic affinity.

8. (Currently amended) The device of claim 1 ~~according to any one of the preceding claims~~, wherein said luminophore material comprises at least one metallocyclic compound, which satisfies the structural formula $M L L' L''$, in which M represents a transition metal, L, L' and L'' represent, each independently of the others, a chelating ligand, which satisfies the structural formula:



in which Y represents an electron-donor heteroatom.

9. (Currently amended) The device of claim ~~according to Claim 8~~, wherein M represents iridium (Ir).

10. (Currently amended) The device of claim 8 ~~according to either Claim 8 or Claim 9~~, wherein M is positively formally charged.

11. (Currently amended) The device of claim 1 ~~according to any one of Claims 1 to 7~~, wherein said luminophore material comprises at least one metallocyclic compound, which satisfies the structural formula $M' L L'$, in which M' represents a transition metal, L and L'

represent, each independently of the other, a chelating ligand, which satisfies the structural formula:

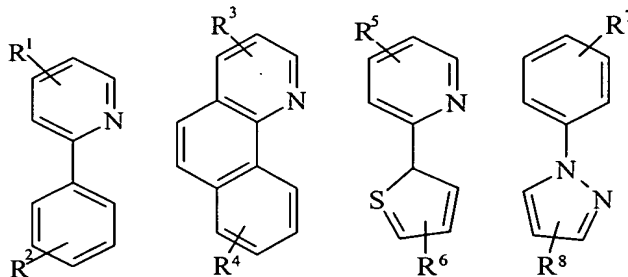


in which Y represents an electron-donor heteroatom; M' representing a transition metal chosen in the group consisting of:

- platinum (Pt); and
- palladium (Pd).

12. (Currently amended) The device of claim ~~according to Claim~~ 11, wherein M' is positively formally charged.

13. (Currently amended) The device of claim 8 ~~according to any one of Claims 8 to 12,~~ wherein the chelating ligands L, L' and L'' satisfy, each independently of the others, a structural formula chosen in the group consisting of:



in which R¹, R², R³, R⁴, R⁵, R⁶, R⁷, and R⁸ represent, each independently of the others, one chosen from among:

- an alkyl group,

- an aryl group,
- a condensate ring, or
- a hydrogen atom;

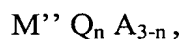
L, L' and L'' being negatively formally charged.

14. (Currently amended) The device of claim 8 ~~according to any one of Claims 8, 9, 10 and 13~~, wherein said metallocyclic compound is iridium tris (2-phenylpyridine) (Ir(ppy)₃).

15. (Currently amended) The device of claim 11 ~~according to any one of Claims 11 to 13~~, wherein said metallocyclic compound is chosen in the group consisting of:

- platinum bis (2-thienylpyridine); and
- platinum bis (2-phenylpyridine).

16. (Currently amended) The device of claim 1 ~~according to any one of the preceding claims~~, wherein said luminophore material comprises at least one organometallic complex which satisfies the structural formula:



in which n is comprised between 1 and 3, each Q is, independently of the other Qs, a quinoline derivative, and each A is, independently of the other As, a phenol derivative, and in which M'' is a metal, having a positive formal charge, chosen in the group consisting of:

- aluminium (Al), and
- gallium (Ga).

17. (Currently amended) The device of claim ~~according to Claim 16~~, wherein the organometallic complex is alumino bis (phenol)(8-hydroxyquinaldine) (Alqfen₂).

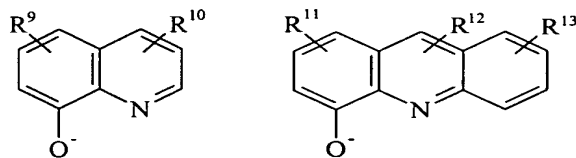
18. (Currently amended) The device of claim 1 ~~according to any one of the preceding claims~~, wherein said luminophore material comprises at least one organometallic complex, which satisfies the structural formula:



in which m is 1 or 2, each Q is, independently of the other Qs, a quinoline derivative, and each A is, independently of the other As, a phenol derivative, and in which M⁺⁺⁺ is a metal, having a positive formal charge, chosen in the group consisting of:

- zinc (Zn), and
- beryllium (Be).

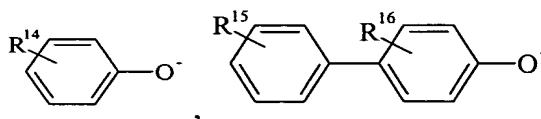
19. (Currently amended) The device of claim 16 ~~according to Claim 16 or Claim 18~~, wherein each Q represents, independently of the other Qs, a quinoline derivative, which satisfies a structural formula chosen in the group consisting of:



in which R⁹, R¹⁰, R¹¹, R¹² and R¹³ represent, each independently of the others, one chosen from among:

- an alkyl group,
- a hydrogen atom, or
- an aryl group.

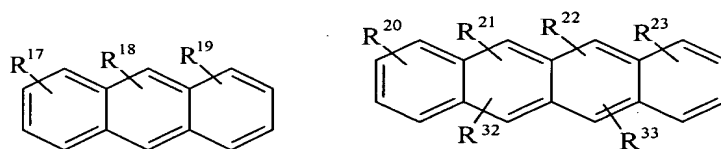
20. (Currently amended) The device of claim 16 ~~according to any one of Claims 16 to 19,~~ wherein each A is a phenol derivative, which satisfies, independently of the other As, a structural formula chosen in the group consisting of:



in which R¹⁴, R¹⁵ and R¹⁶ represent, each independently of the others, one chosen from among:

- an alkyl group,
- a hydrogen atom, or
- an aryl group.

21. (Currently amended) The device of claim 1 ~~according to any one of the preceding claims,~~ wherein said luminophore material comprises at least one aromatic hydrocarbon with condensate rings, which satisfies a structural formula chosen in the group consisting of:

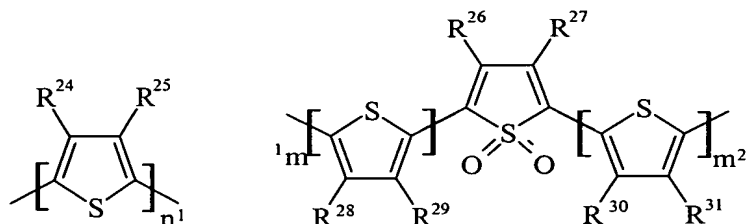


in which R¹⁷, R¹⁸, R¹⁹, R²⁰, R²¹, R²², R²³, R³² and R³³ represent, each independently of the others, one chosen from among:

- an alkyl group,
- a hydrogen atom, or
- an aryl group.

22 (Currently amended) The device of claim ~~according to~~ Claim 21, wherein said aromatic hydrocarbon with condensate rings is rubrene.

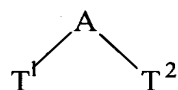
23. (Currently amended) The device of claim 1 ~~according to any one of the preceding~~ claims, wherein said luminophore material comprises at least one thiophene derivative which satisfies a structural formula chosen in the group consisting of:



in which n^1 is an integer comprised between 3 and 7, m^1 and m^2 are, each independently of the other, integers comprised between 1 and 3, in which R^{24} , R^{25} , R^{26} , R^{27} , R^{28} , R^{29} , R^{30} and R^{31} represent, each independently of the others, one chosen from among:

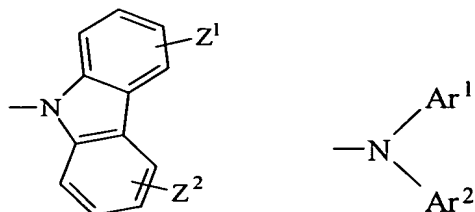
- an alkyl group,
- a hydrogen atom, or
- an aryl group.

24. (Currently amended) The device of claim 1 ~~according to any one of the preceding~~ claims, wherein said hole-transporting organic material is substantially represented by a tertiary aromatic amine; the tertiary aromatic amine satisfying the structural formula:



in which T^1 and T^2 represent, each independently of the other, a tertiary amine; and in which A represents an aryl group.

25. (Currently amended) The device of claim ~~according to Claim 24~~, wherein T¹ and T² represent, each independently of the other, a tertiary amine which satisfies a structural formula chosen in the group consisting of:



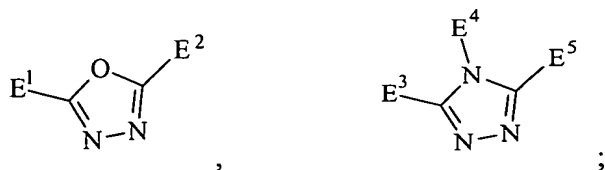
in which Z¹ and Z², represent, each independently of the other, one chosen from among:

- an alkyl group,
- an alcohol group, or
- a hydrogen atom;

in which Ar¹ and Ar² represent, each independently of the other, an aryl group.

26. (Currently amended) The device of claim 24 ~~according to Claim 24 or Claim 25~~, wherein said hole-transporting organic material comprises 4,4',4''-tris (*N*-3-methylphenyl-*N*-phenylamino)-triphenylamine (m-MTDATA).

27. (Currently amended) The device of claim 1 ~~according to any one of the preceding claims~~, wherein said electron-transporting organic material is substantially constituted by a heterocyclic compound which satisfies a structural formula chosen in the group consisting of:



in which E¹, E², E³, E⁴ and E⁵ represent, each independently of the others, an aryl group.

28. (Currently amended) The device of claim 1 ~~according to any one of the preceding claims~~, wherein said electron-transporting organic material comprises 2-(4-biphenyl)-5-phenyl-1,3,4-oxadiazole (PBD).

29. (Original) A method for producing an organic electroluminescent device; the method comprising a depositing step for depositing an intermediate element (7) on an anode (2); and an apposition step for positioning a cathode (3) on said intermediate element (7); the intermediate element (7) comprising at least one luminophore material; the luminophore material being designed to emit electromagnetic radiation; the method being characterized in that said intermediate element (7) comprises at least one hole-transporting organic material and at least one electron-transporting organic material; the electron-transporting organic material and the hole-transporting organic material being designed to form between them exciplexes or electroplexes; the luminophore material being supplied, in use, for transfer of energy from said exciplexes or electroplexes.

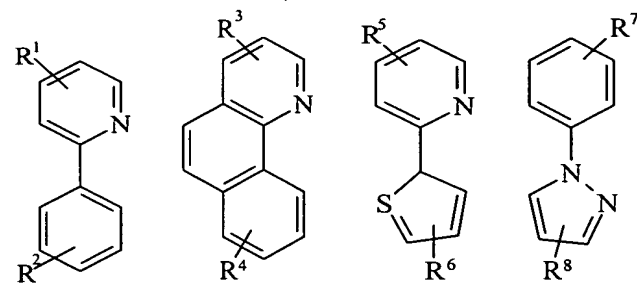
30. (Currently amended) The method of claim ~~according to Claim~~ 29, wherein said luminophore material is chosen so that said electromagnetic radiation is of a given wavelength.

31. (Currently amended) The method of claim 29 ~~according to Claim 29 or 30~~, wherein said depositing step comprises a first depositing substep for depositing said first layer (4) on an anode (2); and a second depositing substep for depositing the second layer (6) on the first layer (4); of positioning a cathode (3) on said second layer (6).

32. (Currently amended) The method of claim ~~according to Claim~~ 31, wherein, during said first depositing substep, said luminophore material is deposited.

33. (Currently amended) The method of claim 31 ~~according to Claim 31 or 32~~, wherein, during said first depositing substep polycarbonate, is deposited.

34. (Currently added) The device of claim 11, wherein the chelating ligands L, L' and L'' satisfy, each independently of the others, a structural formula chosen in the group consisting of:

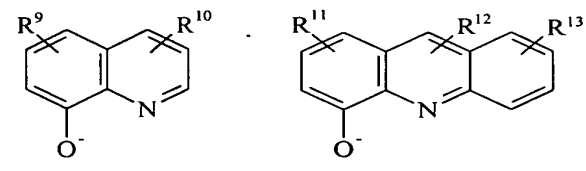


in which R¹, R², R³, R⁴, R⁵, R⁶, R⁷, and R⁸ represent, each independently of the others, one chosen from among:

- an alkyl group,
- an aryl group,
- a condensate ring, or
- a hydrogen atom;

L, L' and L'' being negatively formally charged.

35. (Currently added) The device of claim 18, wherein each Q represents, independently of the other Qs, a quinoline derivative, which satisfies a structural formula chosen in the group consisting of:

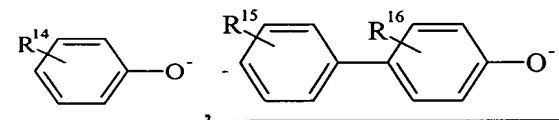


in which R^9 , R^{10} , R^{11} , R^{12} and R^{13} represent, each independently of the others, one chosen from

among:

- an alkyl group,
- a hydrogen atom, or
- an aryl group.

36. (Currently added) The device of claim 18, wherein each A is a phenol derivative,
which satisfies, independently of the other As, a structural formula chosen in the group
consisting of:



in which R^{14} , R^{15} and R^{16} represent, each independently of the others, one chosen from among:

- an alkyl group,
- a hydrogen atom, or
- an aryl group.